General

Title

Asthma: proportion of emergency department visits for asthma that meet criteria for the ED being the appropriate level of care among all ED visits for asthma in adolescents age 19 to 21 years old with identifiable asthma.

Source(s)

CHIPRA Pediatric Quality Measures Program (PQMP) candidate measure submission form (CPCF): appropriateness of emergency department visits for children and adolescents with identifiable asthma. Rockville (MD): Collaboration for Advancing Pediatric Quality Measures (CAPQuaM); 63 p. [115 references]

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Process

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the proportion of emergency department (ED) visits for asthma that meet criteria for the ED being the appropriate level of care among all ED visits for asthma in adolescents age 19 to 21 years with identifiable asthma.

Note from the National Quality Measures Clearinghouse: Separate numerators and denominators are reported for children age 2 to 5, 6 to 11, 12 to 18, and, optionally, 19 to 21 years. See the related Collaboration for Advancing Pediatric Quality Measures (CAPQuaM) measure summaries in the Emergency Department Use for Children with Asthma -- Appropriateness Set for additional age strata.

Rationale

Asthma matters for pediatrics (World Health Organization [WHO], 2011; Adams, Smith, & Ruffin, 2000; Bahadori et al., 2009; Weiss, Gergen, & Hodgson, 1992; Coventry, Weston, & Collins, 1996; American

Lung Association [ALA], 2012; Fuhrman et al., 2011; Sawicki et al., 2010; Manice, 2013; Cerdan et al., 2012; Fiese et al., 2008; Okelo et al., 2004). It is one of the most common chronic diseases in children, affecting an estimated 7.1 million children in the United States (Centers for Disease Control and Prevention [CDC], 2011). In 2011, 4.1 million children suffered from an asthma attack or episode. It is the second most common reason (after allergy) for children to be classified as having a special health care need, accounting for nearly 38.8% of such children. Pediatric asthma is more prevalent in minority populations. Lifetime prevalence rates of asthma in Hispanic and Black children are 12.4% and 15.8% respectively (Lara et al., 2006).

The developer's analysis of Healthcare Cost and Utilization Project (HCUP) data estimated that children between 1 and 17 years old had more than 673,000 emergency department (ED) visits with asthma as the first diagnosis; almost 11% (or greater than 71,000) of these visits resulted in hospitalization. Considering all ages, asthma ED visits are common in all regions of the country, with a plurality in the South and fewer in the West. They are relatively evenly split between teaching and non-teaching hospitals and nearly 86% of visits occur for patients who live in metropolitan areas. Specifically, about 56% of visits are in large metropolitan or suburban areas, 29% in smaller metropolitan areas and almost 15% in areas considered rural. Asthma exacerbations (including ED visits and subsequent hospitalizations) are consequential for the health and well-being of children and their families and may cost as much as $18 billion per year across all ages (Manice, 2013; Cerdan et al., 2012; Fiese et al., 2008; Okelo et al., 2004).

Appropriate use of the emergency department has been debated for decades. In her seminal article nearly three decades ago, DeAngelis included an asthma attack as an appropriate indication for use of the ED (DeAngelis, Fosarelli, & Duggan, 1985).

High rates of asthma visits to the emergency department (ED) suggest widespread deficiencies in asthma care. The literature shows that lack of proper asthma care is disparate with minority children bearing undue burden (Price et al., 2013; Homer et al., 1996; Finkelstein et al., 1995).

The literature also presents different perspectives on appropriate use of the ED for pediatric asthma. Pediatric asthma is one of the leading conditions when it comes to avoidable ED visits (Flores et al., 2003). Asthma has been classified both as an avoidable hospitalization condition (AHC) and as an ambulatory care sensitive condition. This describes that many ED visits or hospital admissions could have been avoided with proper outpatient care (Flores et al., 2003; Knudson et al., 2009). Poor outpatient care can be an outcome of a number of variables. As noted, the availability of primary care can reduce such inappropriate visits (Parchman & Culler, 1994; Flores et al., 2003; Bindman et al., 1995). Parents may choose to come to the ED if they cannot get a timely appointment with their primary care provider (PCP), have had poor experience with their PCP, or feel the treatment in the ED is of a higher quality or safer than the ambulatory office. Parents may also panic when a child suddenly has trouble breathing and simply believe the child's symptoms require emergency care. A potentially preventable visit, however, is not the same as an inappropriate or unnecessary visit – sick asthmatic children may require ED care.

It is well understood that children who receive optimal asthma management and those who are well connected with their primary care practice are less likely to require an ED visit or a hospitalization than those who are less well managed or lack effective primary care. Well developed scientific guidelines exist (National Heart, Lung, and Blood Institute [NHLBI], 2011).

Reducing the relative number of ED visits during the care for asthmatic children remains a high priority on the national agenda and holds the promise of both financial savings and improved health-related quality of life. Overuse of the ED for all diagnoses is estimated to cost approximately $38 billion per year (New England Healthcare Institute [NEHI], 2010). One study illustrated the financial burden of non-urgent ED visits by calculating that treatment of an upper respiratory infection cost twice as much in the ED as compared to a family practitioner's office (Martin, 2000). Other detriments of ED overuse include overcrowding, long wait times, and an unnecessary workload on staff who work in a high pressure environment; overuse detracts from patients who truly need this level of care.

Assessing the extent to which ED use for asthma is appropriate can inform health policy, manpower

planning, and clinical quality improvement activities. It can help to answer the question of how much of ED use potentially may be prevented by better management of the underlying asthma, versus how much requires other, process or structural improvements to reduce use of the ED when a lower level of care would meet the clinical needs of the child. Refractory asthma or those with unavoidable environmental exposures leading to an acute exacerbation requiring medical care are likely to be identified as appropriate, reminding us that NOT all asthma ED visits are preventable even with optimal care.

With a better understanding of ED use, health care organizations and policy makers could develop better informed approaches to optimizing services for children with asthma. And hopefully children and their families may increasingly be spared the inconvenience, risk, and costs of ED visits for asthma.

Evidence for Rationale

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Primary Health Components

Asthma; emergency department (ED) visits; appropriateness; adolescents

Denominator Description

The denominator represents a random sample of patients age 19 to 21 years who have visited the emergency department (ED) for asthma (as a first or second diagnosis) and meet the specified criteria for having identifiable asthma.

See the related "Denominator Inclusions/Exclusions" field.

Numerator Description

The numerator is defined as the number of denominator events that that also satisfy at least one of the explicit appropriate use criteria and are in the random sample.

See the related "Numerator Inclusions/Exclusions field.

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

A systematic review of the clinical research literature (e.g., Cochrane Review)

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Children with asthma comprise a critically important population for Medicaid.

The developer's analysis of the 2011 National Survey of Children's Health (NSCH) suggests that more than 2.65 million children age 2 and above in Medicaid have at one time been told they have asthma. Further, of all children whose parents report them to be in fair or poor health, 40% have asthma. Children with asthma also are 23% less likely than those without to have their health reported as very good or excellent. Asthma spans the country with rates among Medicaid children (NSCH) ranging from 10.1% in Alaska to 28.8% in Kentucky. As a point of reference, 22.2% of Medicaid children in New York State have been told they have asthma. Asthma is prevalent in white, black, and Hispanic children in Medicaid and in all age groups. Nationally, more than 35 of every 1000 Medicaid children will visit the emergency department (ED) for asthma, with about 11% resulting in hospitalization (using Healthcare Cost and Utilization Project [HCUP] data).

Among children with special health care needs, using the 2007 National Survey of Children with Special Health Care Needs (NS-CSHCN), minority children were found to be overrepresented with asthma. Thirty-eight percent of children with asthma have public insurance. One quarter (26%) live in households under the federal poverty line, 28% under twice the federal poverty line, and only 24% have incomes more than four times the federal poverty line. Nearly three quarters of these children have at least one sibling, with

more than one-third of those siblings also having a special health care need, using Health Resources and Services Administration's (HRSA) screening tool to identify a CSHCN. It was also found that racial minorities, lower income, and household educational attainment were independent predictors of ED utilization among children with asthma. The analysis of New York State Medicaid data also shows about a 2.5 fold increase in the rate of using the ED of non-Hispanic blacks compared to non-Hispanic whites (non-Hispanic black greater than all Hispanic greater than Non-Hispanic white greater than Asian). Asthma matters for all sorts of children in Medicaid.

A study compared children insured by Medicaid to children insured by commercial payers in the same health maintenance organization and found that Medicaid-insured children were 1.4 times more likely to visit the ED for asthma and 1.3 times more likely to be hospitalized for asthma (Finkelstein et al., 2000). In addition, almost half of all hospitalizations of children for asthma are billed to Medicaid (Owens et al., 2003). Recent estimates using National Hospital Ambulatory Medical Care Survey (NHAMCS) data peg the overall costs of ED for childhood asthma at $272 million in 2010 (Pearson et al., 2014), even though their estimate of the number of ED visits is less than our estimation, which used HCUP data. Asthma ED use matters for Medicaid programs. Evidence from Oregon suggests that Medicaid ED visits increase with Medicaid expansion (Taubman et al., 2014). There may be supply shortages of primary care providers (PCPs), or some doctors may be unwilling to see Medicaid patients.

ED use and hospitalization are considered to be potentially undesirable outcomes of asthma care. Some of these outcomes are challenging to prevent, resulting from refractory disease, unavoidable exposures, or environmental conditions that are outside the realm of clinical prevention. Many visits are avoidable, predicated upon optimal care delivery – that is, appropriate well-coordinated and continuous primary care that incorporates shared-decision making to optimize individual management using effective controller medications as appropriate, articulated in a written asthma management plan. Others are preventable when high quality acute care services are readily available. Environmental control writ small (e.g., avoiding exposure to cigarette smoke, wrapping mattresses in protective covers) and writ large (e.g., air quality) can reduce asthma exacerbations – these activities are typically outside of the clinical realm (Dick et al., 2014; Kearney et al., 2014; Roy, Downes, & Wisnivesky, 2011; Roy et al., 2011; Roy & Wisnivesky, "Comprehensive use," 2010; Roy & Wisnivesky, "Racial and ethnic differences," 2010; Downes et al., 2010).

Evidence for Additional Information Supporting Need for the Measure

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Extent of Measure Testing

For this measure, the developer conducted a single site age-stratified chart audit of patients with asthma seen in Mount Sinai's emergency department (ED).

Reliability

The explicit criteria were developed using a slightly modified version of the RAND/University of California at Los Angeles (UCLA) Appropriateness Method that maintained the key aspects of that approach, including a detailed literature review, a multidisciplinary and geographically diverse expert panel comprised of both clinicians and researchers, and the two round modified Delphi Process. The general reliability of this approach is well established (Fitch et al., 2001; Kosecoff et al., 1987). It has been applied successfully to pediatric services previously (Kleinman et al., 1994; Kleinman, Boyd, & Heritage, 1997; Keyhani et al., 2008). In order to enhance the validity of the meaning of appropriate, limited criteria were used for this measure to those items whose median rating is 8 or 9, the two highest ratings.

Testing of the criteria during chart audit used a paper data collection instrument that was largely a checklist of yes/no for the various items. After a brief training by the physician who organized the testing three non-clinical research assistants (one Master of Public Health [MPH], 2 Bachelors) conducted chart audits. Kappa on 10 random charts with the gold standard of the physician lead, were .696, .577 and .593 respectively, with a group kappa of .431. A second training session included identifying potential synonyms, particularly for labored breathing, such as "in respiratory distress", "notably increased respiratory effort", "nasal flaring", and "increased work of breathing or (WoB)." Synonyms for markedly decreased breath sounds were defined to include poor "air exchange" or "air entry." A subsequent reevaluation of kappa on 10 different random charts found kappas with the physician lead to be .969, .954 and .938, with a group kappa of .923, indicating excellent agreement in the reliability of the chart audit to identify numerator events after two training sessions with review practiced in between.

Testing of the administrative data analysis approach in New York State Medicaid (analyses performed by the New York State Department of Health) identified 62,052 ED visits or hospitalizations for asthma, of which 59,469 (95.8%) were identified using ED data alone and 2,583 on the basis of hospital codes alone. A distinct analysis conducted for Collaboration for Advancing Pediatric Quality Measures (CAPQuaM) by the New York State Department of Health team using Statewide Planning and Research Cooperative

System (SPARCS) data found that approximately 81% of all Medicaid hospitalizations for asthma came from the ED. Performing the calculations suggests that failure to look at hospitalizations for asthma in addition to ED visits would miss 2,087 ED visits in the denominator, all of which would also qualify for the numerator.

Validity
The developer randomly identified up to 3 ED visits per child over a four year period (October 2009 to November 2013). Inclusion criteria included an ED visit with asthma as a primary or secondary diagnosis as documented in the medical record. Three samples were developed, stratified by age: 2 to 5 years, 6 to 11 years, and 12 to 18 years.

For children 2 to 5: 181 of 335 audits (54.0%) were deemed appropriate based upon information in the chart audit. Reasons for meeting the criteria included low oxygen saturation (2.1%), referral from their primary care provider (PCP) (8.4%), and various manifestations of respiratory distress (labored breathing/retractions 46.6%, accessory muscle use 13.4%, markedly decreased breath sounds 13.1%). No arterial blood gasses or specialist consultations in the ED were ordered. 14.0% were admitted to the hospital.

For children 6 to 11: 209 of 477 audits (43.8%) were deemed appropriate based upon information in the chart audit. Reasons for meeting the criteria included low oxygen saturation (1.9%), referral from their PCP (4.4%), and various manifestations of respiratory distress (labored breathing/retractions 36.1%, accessory muscle use 7.5%, markedly decreased breath sounds 15.9%). No arterial blood gasses or specialist consultations in the ED were ordered. 11.5% were admitted to the hospital.

Adolescents aged 12 to 18: 165 of 341 audits (48.4%) were deemed appropriate based upon information in the chart audit. Reasons for meeting the criteria included low oxygen saturation (0.3%), referral from their PCP (2.3%), and various manifestations of respiratory distress (labored breathing/retractions 35.1%, accessory muscle use 6.4%, markedly decreased breath sounds 22.5%). No arterial blood gasses or specialist consultations in the ED were ordered. 12.9% were admitted to the hospital.

Appropriateness varied by age (Chi^2=8.2, p=.02), with younger (p=.01) and school aged (p=.01) children each being significantly different; Adolescents experienced a level of appropriateness intermediate to the other two groups and were not significantly different from them when combined (i.e., comparing adolescents to all others). Racial differences were also found with Hispanics at 44.1% appropriateness, non-Hispanic blacks at 51.3%, whites at 56.5% and all others at 72.2%. Chi square with 3 degrees of freedom was 15.4, with p=.0015. The appropriateness of ED visits for Hispanic children was less than for other children (p=.002).

In summary, this measure was developed using a rigorous process that integrated the literature, stakeholder perspectives, an expert panel, and a rigorous testing process. The developer has previously demonstrated the validity of identifiable asthma as a meaningful construct. They use well accepted methods to identify emergency department visits, and performed a rigorous test to demonstrate both the reliability of the chart audit and the capacity to identify variations in performance across categorical variables such as age and race.

Evidence for Extent of Measure Testing

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State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Emergency Department

Hospital Outpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Clinical Practice or Public Health Sites

Statement of Acceptable Minimum Sample Size

Specified

Target Population Age

Age 19 to 21 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding Period

The reporting year

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Encounter

Patient/Individual (Consumer) Characteristic

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions
The denominator represents a random sample of patients age 19 to 21 years who have visited the emergency department (ED) for asthma (as a first or second diagnosis) and meet the specified criteria for having identifiable asthma.

The presence of identifiable asthma is established each month from administrative data using the specified algorithm and evidence includes:

Any prior hospitalization with asthma as primary or secondary diagnosis
OR

Other qualifying events:
- Three or more ambulatory visits with diagnosis of asthma or bronchitis, OR
- Two or more ambulatory visits with a diagnosis of asthma and/or bronchitis AND one or more asthma-related prescriptions

OR

For children older than five who have an ED visit for asthma (as first or second diagnosis) in the reporting month and prior to the reporting month who have had:
- One or more prior ambulatory visits with asthma as the primary diagnosis after the fifth birthday, OR
- Two or more ambulatory visits after the fifth birthday with asthma as a diagnosis, OR
- One ambulatory visit with asthma as a diagnosis AND at least one asthma-related prescription, both occurring after the fifth birthday, OR
- Two or more ambulatory visits with a diagnosis of bronchitis after the fifth birthday

Note:

Refer to Table 1 in the original measure documentation for Current Procedural Terminology (CPT), Revenue, International Classification of Diseases, Ninth Revision [ICD-9], and International Classification of Diseases, Tenth Revision, Clinical Modification [ICD-10-CM] codes, and asthma related medications associated with the criteria for assessing identifiable asthma.
For eligibility purposes, asthma-related medicine means long-acting beta-agonist (alone or in combination) or inhaled corticosteroid (alone or in combination), antiasthmatic combinations, methylxanthines (alone or in combination), and/or mast cell stabilizers.
All events in the administrative data should be associated with a date of service.

Exclusions

Children with concurrent or pre-existing:
- Chronic obstructive pulmonary disease (COPD) diagnosis (International Classification of Diseases, Ninth Revision [ICD-9] code: 496) (International Classification of Diseases, Tenth Revision, Clinical Modification [ICD-10-CM] code: J44);
- Cystic fibrosis diagnosis (ICD-9 code 277.0, 277.01. 277.02, 277.03, 277.09) (ICD-10-CM code: E84);
- Emphysema diagnosis (ICD-9 code 492xx) (ICD-10-CM code: J43)

Children without a prior established medical history of an asthma diagnosis of at time of ED visit
Any child that does not meet the age requirement
Failure to have three months of continuous enrollment including the reporting month

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
The numerator is defined as the number of denominator events that that also satisfy at least one of the explicit appropriate use criteria and are in the random sample (refer to Section II, Technical Specifications, of the original measure documentation).

Presence or absence of documented evidence of any of the following:

- The child or adolescent was transferred or admitted to an inpatient hospital directly from the emergency department (ED) (may be administrative or chart review evidence).
- The child or adolescent was referred to the ED by their primary care clinician or other clinician after being evaluated
- Prior to arrival in the ED, the child received two or more doses of inhaled rescue medications for the episode without clinical improvement (documentation of parent/caregiver report sufficient)
- Prior to arrival to the ED the child was found to be in a pre-defined and individualized "red zone" of peak flow measurement (documentation of parent/caregiver report sufficient)
- Physical exam evidence of respiratory distress or labored breathing in the ED, such as:
  - Retractions,
  - Accessory muscle use, OR
  - Markedly decreased breath sounds
- An oxygen (O_2) saturation less than 90%
- An arterial blood gas (ABG) test was obtained
- A consult with a pulmonologist or other asthma specialist was obtained in the ED

Exclusions
Numerator events occurring in patients who do not meet denominator criteria OR are not in the random sample for inclusion

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Electronic health/medical record

Paper medical record

Type of Health State

Does not apply to this measure

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a higher score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Stratification Variables:

Race/ethnicity: Hispanic, non-Hispanic black, non-Hispanic white; non-Hispanic Asian/Pacific Islander, other non-Hispanic
Public vs. commercial (private insurance)
Health Maintenance Organization (HMO) vs. Preferred Provider Organization (PPO) vs. Fee for Service (FFS) vs. Primary Care Case Management (PCCM) vs. other; within Medicaid, states may ask for reporting of FFS vs. Managed Care or other relevant enrollment categories.
Urban Influence Code (UIC). Identify the UIC. Use parent or primary caregiver's place of residence to determine UIC.
Identify the level of poverty in the parent or primary caregiver's county of residence. Stratification standards are based on 2011 US population data analyzed with SAS 9.3. Using parent or primary caregiver's state and county of residence (or equivalent) or FIPS code, use the variable PCTPOVALL_2011 to categorize into one of 5 strata:

- Lowest quartile of poverty if percent in poverty is less than or equal to 12.5%
- Second quartile of poverty if percent in poverty is greater than 12.5% and less than or equal to 16.5%
- Third quartile of poverty if percent in poverty is greater than 16.5% and less than or equal to 20.7%
- First upper quartile (75th to 90th) if percent in poverty is greater than 20.7% and less than or equal to 25.7%
- Second upper quartile (greater than 90th percentile)

Note: Refer to the original measure documentation for URLs to obtain codes and additional details.

Standard of Comparison

not defined yet

Identifying Information

Original Title

Appropriateness of emergency department visits for children and adolescents with identifiable asthma.

Measure Collection Name

Emergency Department Use for Children with Asthma -- Appropriateness Set

Submitter

Collaboration for Advancing Pediatric Quality Measures - Health Care Quality Collaboration

Developer

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Funding Source(s)

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Composition of the Group that Developed the Measure

Unspecified

Financial Disclosures/Other Potential Conflicts of Interest

Unspecified

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2014 Aug

Measure Maintenance

Unspecified

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

Measure Availability

Source available from the Collaboration for the Advancement of Pediatric Quality Measures (CAPQuaM) Web site .

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NQMC Status

This NQMC summary was completed by ECRI Institute on July 13, 2015. The information was not verified by the measure developer.

Copyright Statement

Production

Source(s)

CHIPRA Pediatric Quality Measures Program (PQMP) candidate measure submission form (CPCF): appropriateness of emergency department visits for children and adolescents with identifiable asthma. Rockville (MD): Collaboration for Advancing Pediatric Quality Measures (CAPQuaM); 63 p. [115 references]

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